CLAIMS

WHAT IS CLAIMED IS:

1. An isolated or recombinant nucleic acid comprising a polynucleotide sequence selected from the group consisting of:

(a) SEQ ID NO:1 or a complementary polynucleotide sequence thereof;

(b) a polynucleotide sequence that is greater than 97.8% identical to SEQ ID NO:1 or a complementary polynucleotide sequence thereof, as determined by BLASTN using default parameters;

(c) a polynucleotide sequence that hybridizes under stringent conditions over substantially the entire length of a polynucleotide subsequence comprising at least 100 contiguous nucleotides of SEQ ID NO:1 or a complementary polynucleotide sequence thereof, wherein the polynucleotide sequence hybridizes to the polynucleotide subsequence of SEQ ID NO:1 or the complementary polynucleotide sequence thereof under said stringent conditions with at least 2x a signal to noise ratio that the polynucleotide sequence hybridizes to a corresponding polynucleotide subsequence of SEQ ID NO:13 or a complementary polynucleotide sequence thereof;

(d) a polynucleotide sequence comprising at least one unique polynucleotide subsequence comprising at least 10 contiguous nucleotides of SEQ ID NO:1 or a complementary polynucleotide sequence thereof, with the proviso that the unique polynucleotide subsequence includes at least one subsequence not included in SEQ ID NOs:14-19 or a complementary polynucleotide sequence thereof; and,

(e) a polynucleotide sequence encoding an amino acid sequence or unique subsequence selected from the group consisting of SEQ ID NOs:2-11 or an artificial conservative variation thereof.

2. The nucleic acid of claim **1**, wherein the nucleic acid is selected from the group consisting of a DNA, an RNA, and an artificial nucleic acid.

3. The nucleic acid of claim **2**, wherein the nucleic acid is a cDNA.

4. The nucleic acid of claim **1**, wherein the polynucleotide sequence of (b) is at least 98.5% identical to SEQ ID NO:1 or a complementary polynucleotide sequence thereof, as determined by BLASTN using default parameters.

5. The nucleic acid of claim **1**, wherein the polynucleotide sequence of (c) hybridizes to the polynucleotide subsequence of SEQ ID NO:1 or the complementary polynucleotide sequence thereof under said stringent conditions with at least 5x the signal to noise ratio that the polynucleotide sequence of (c) hybridizes to the polynucleotide subsequence of SEQ ID NO:13 or the complementary polynucleotide sequence thereof.

6. The nucleic acid of claim **1**, comprising at least one artificially mutated nucleotide.

7. The nucleic acid of claim **6**, wherein the at least one artificially mutated nucleotide comprises one or more of: a deleted nucleotide, an inserted nucleotide, or a substituted nucleotide.

8. The nucleic acid of claim **6**, comprising a plurality of artificially mutated nucleotides.

9. The nucleic acid of claim **6**, wherein the artificially mutated nucleotide is introduced by site-directed mutagenesis.

10. The nucleic acid of claim **6**, wherein at least one polypeptide encoded by the nucleic acid comprises at least one deleted, inserted, or substituted amino acid residue.

11. The nucleic acid of claim **10**, wherein the polypeptide comprises at least one conservatively substituted amino acid residue.

12. The nucleic acid of claim **6**, wherein the at least one artificially mutated nucleotide is located in the open reading frame encoding the polypeptide of SEQ ID NO:12.

13. The nucleic acid of claim **12**, wherein the at least one artificially mutated nucleotide comprises a deletion.

14. The nucleic acid of claim **13**, wherein the open reading frame encoding the polypeptide of SEQ ID NO:12 is deleted.

15. The nucleic acid of claim **13**, wherein the nucleotides encoding amino acid residues 164-197 of SEQ ID NO:12 are deleted.

16. The nucleic acid of claim **6**, wherein the at least one artificially mutated nucleotide is located in the open reading frame encoding the polypeptide of SEQ ID NO:10.

17. The nucleic acid of claim **16**, wherein the at least one artificially mutated nucleotide comprises a deletion.

18. The nucleic acid of claim **17**, wherein the open reading frame encoding the polypeptide of SEQ ID NO:10 is deleted.

19. The nucleic acid of claim **16**, wherein at least one of the nucleotides encoding amino acid residue 1, amino acid residue 4, amino acid residue 10, or a combination thereof, of SEQ ID NO:10 is mutated.

20. The nucleic acid of claim **1**, wherein the unique polynucleotide subsequence of (d) encodes at least 20 contiguous amino acid residues of any one of SEQ ID NOs:2-12.

21. The nucleic acid of claim **20**, wherein the unique polynucleotide subsequence of (d) encodes at least 50 contiguous amino acid residues of any one of SEQ ID NOs:2-12.

22. The nucleic acid of claim **21**, wherein the unique polynucleotide subsequence of (d) encodes at least 100 contiguous amino acid residues of any one of SEQ ID NOs:2-12.

23. The nucleic acid of claim **22**, wherein the unique polynucleotide subsequence of (d) encodes at least 200 contiguous amino acid residues of any one of SEQ ID NOs:2-12.

24. The nucleic acid of claim **1**, wherein the unique polynucleotide subsequence of (d) comprises at least one complete open reading frame.

25. The nucleic acid of claim **24**, wherein the complete open reading frame encodes a polypeptide selected from the group consisting of SEQ ID NOs: 2-12.

26. The nucleic acid of claim **24**, comprising a plurality of complete open reading frames.

27. The nucleic acid of claim **1**, wherein the nucleic acid of (d) further comprises at least one polynucleotide subsequence from a different strain of virus.

28. The nucleic acid of claim **27**, wherein the different strain of virus is a different strain of human RSV.

29. The nucleic acid of claim **27**, wherein the different strain of virus is a different species of virus.

30. The nucleic acid of claim **27**, wherein the nucleic acid comprises at least one complete open reading frame of SEQ ID NO:1 and at least one complete open reading frame of the different strain of virus.

31. A vector comprising the nucleic acid of claim **1**.

32. A host cell into which the vector of claim **31** has been introduced.

33. A method of producing a recombinant respiratory syncytial virus, the method comprising:

culturing the host cell of claim **32** in a suitable culture medium under conditions permitting expression of the nucleic acid; and,

isolating the recombinant respiratory syncytial virus from the host cell and/or the medium.

34. A recombinant respiratory syncytial virus produced according to the method of claim **33**.

35. A recombinant respiratory syncytial virus comprising the nucleic acid of claim **1**.

36. The recombinant respiratory syncytial virus of claim **35**, wherein the nucleic acid comprises at least one artificially mutated nucleotide.

37. The recombinant respiratory syncytial virus of claim **36**, wherein the open reading frame encoding the polypeptide of SEQ ID NO:12 is deleted.

38. The recombinant respiratory syncytial virus of claim **36**, wherein the open reading frame encoding the polypeptide of SEQ ID NO:10 is deleted.

39. An immunogenic composition comprising an immunologically effective amount of the recombinant respiratory syncytial virus of claim **35**.

40. A method for stimulating the immune system of an individual to produce a protective immune response against respiratory syncytial virus, the method comprising administering to the individual an immunologically effective amount of the recombinant respiratory syncytial virus of claim **35** in a physiologically acceptable carrier.

41. A method of producing an isolated or recombinant polypeptide, the method comprising:

culturing the host cell of claim **32** in a suitable culture medium under conditions permitting expression of the nucleic acid; and,

isolating the polypeptide from the host cell and/or the medium.

42. A polypeptide produced according to the method of claim **41**.

43. A polypeptide comprising an amino acid sequence or subsequence that is encoded by the nucleic acid of claim **1**, with the proviso that the amino acid sequence or subsequence is not encoded by SEQ ID NO:14.

44. An immunogenic composition comprising an immunologically effective amount of the polypeptide of claim **43**.

45. A method for stimulating the immune system of an individual to produce a protective immune response against respiratory syncytial virus, the method comprising administering to the individual an immunologically effective amount of the polypeptide of claim **43** in a physiologically acceptable carrier.

46. An isolated or recombinant polypeptide comprising an amino acid sequence selected from the group consisting of:

(a) an amino acid sequence selected from the group consisting of SEQ ID NOs:2-11;

(b) a unique amino acid subsequence comprising at least 7 contiguous amino acid residues of any one of SEQ ID NOs:2-11;

(c) an amino acid sequence or subsequence corresponding to an artificial conservative variation of an amino acid sequence or subsequence of (a) or (b);

(d) an amino acid sequence that is greater than 99.3% identical to SEQ ID NO:2, an amino acid sequence that is greater than 98.4% identical to SEQ ID NO:3, an amino acid sequence that is greater than 99.7% identical to SEQ ID NO:4, an amino acid sequence that is greater than 98.3% identical to SEQ ID NO:5, an amino acid sequence that is greater than

99.6% identical to SEQ ID NO:6, an amino acid sequence that is greater than 97.0% identical to SEQ ID NO:7, an amino acid sequence that is greater than 99.3% identical to SEQ ID NO:8, an amino acid sequence that is greater than 99.5% identical to SEQ ID NO:9, an amino acid sequence that is greater than 96.4% identical to SEQ ID NO:10, or an amino acid sequence that is greater than 99.2% identical to SEQ ID NO:11, as determined by BLASTP using default parameters;

and,

(e) an amino acid sequence or subsequence that is specifically bound by an antibody that specifically binds to an amino acid sequence or subsequence encoded by SEQ ID NO:1, wherein said antibody does not specifically bind to an amino acid sequence or subsequence encoded by SEQ ID NO:13 or SEQ ID NO:14.

47. The polypeptide of claim **46**, wherein the amino acid sequence of (d) is at least 99.5% identical to SEQ ID NO:2, at least 98.6% identical to SEQ ID NO:3, at least 99.9% identical to SEQ ID NO:4, at least 98.5% identical to SEQ ID NO:5, at least 99.8% identical to SEQ ID NO:6, at least 97.2% identical to SEQ ID NO:7, at least 99.5% identical to SEQ ID NO:8, at least 99.7% identical to SEQ ID NO:9, at least 96.6% identical to SEQ ID NO:10, or at least 99.4% identical to SEQ ID NO:11, as determined by BLASTP using default parameters.

48. The polypeptide of claim **46**, comprising at least one artificially altered amino acid.

49. The polypeptide of claim **48**, wherein the at least one artificially altered amino acid comprises one or more of: a deleted amino acid, an inserted amino acid, or a substituted amino acid.

50. The polypeptide of claim **48**, comprising a plurality of artificially altered amino acids.

51. The polypeptide of claim **46**, wherein the unique amino acid subsequence of (b) or the artificial conservative variation of (c) is immunogenic.

52. An antibody specific for the polypeptide of claim **51**.

53. An immunogenic composition comprising an immunologically effective amount of the polypeptide of claim **46**.

54. A method for stimulating the immune system of an individual to produce a protective immune response against respiratory syncytial virus, the method comprising administering to the individual an immunologically effective amount of the polypeptide of claim **46** in a physiologically acceptable carrier.

55. A recombinant respiratory syncytial virus comprising the polypeptide of claim **46**.

56. The recombinant respiratory syncytial virus of claim **55**, wherein the polypeptide comprises at least one artificially altered amino acid.

57. An immunogenic composition comprising an immunologically effective amount of the recombinant respiratory syncytial virus of claim **55**.

58. A method for stimulating the immune system of an individual to produce a protective immune response against respiratory syncytial virus, the method comprising administering to the individual an immunologically effective amount of the recombinant respiratory syncytial virus of claim **55** in a physiologically acceptable carrier.

59. A nucleic acid encoding the polypeptide of claim **46**.

60. An isolated or recombinant polypeptide comprising the amino acid sequence of SEQ ID NO:12 with a deletion of residues 164-197, or an artificial conservative variation thereof.

61. An immunogenic composition comprising an immunologically effective amount of the polypeptide of claim **60**.

62. A method for stimulating the immune system of an individual to produce a protective immune response against respiratory syncytial virus, the method comprising administering to the individual an immunologically effective amount of the polypeptide of claim **60** in a physiologically acceptable carrier.

63. An isolated or recombinant respiratory syncytial virus comprising the polypeptide of claim **60**.

64. A method for stimulating the immune system of an individual to produce a protective immune response against respiratory syncytial virus, the method comprising administering

to the individual an immunologically effective amount of the respiratory syncytial virus of claim **63** in a physiologically acceptable carrier.

65. A nucleic acid encoding the polypeptide of claim **60**.